Miami-Dade Transit
Metromover Facility
ISO 14001
EMS Case Study

June 2010

Miami-Dade Transit (MDT) Profile

The Miami-Dade Transit (MDT) is the 14th largest public transit system in the United States and the largest one in the State of Florida. MDT delivers transit services to the pubic through the following four transportation modes: Metrobus; Metrorail; Metromover; and, Paratransit.

Metrobus provides bus service throughout Miami-Dade County and some parts of Monroe and Broward Counties, on I-95 routes. The total fleet size of Metrobus is 893 buses. Metrail is a 22.6-mile elevated double-track heavy rail system with 136 vehicles, 22 stations, and 185 daily trips. Metromover is a fully automated people mover transportation system consisting of 4.4 miles of elevated dual-lane track guideway with 21 stations and one maintenance facility. It provides services to a variety of government, businesses, entertainment, and cultural centers in the Central Downtown, Omni, and Brickel Areas. Paratransit is comprised of the Special Transportation Services (STS) program, providing approximately 135,000 trips on a monthly basis. Annual ridership on all modes of MDT transportation is projected to be 114 million. In November 2002, voters approved a one-half percent increase in the sales tax to fund major transportation improvements defined in the People's Transportation Plan (PTP).

MDT's organizational structure is comprised of the Director, a Deputy Director, and eight additional positions responsible for leading distinct functional areas. There are a total of 3,031 budgeted positions in the Department for fiscal year 2008-2009.

In addition, the MDT has three Metrobus repair facilities. These include the Northeast, Central, Coral Way bus maintenance facilities. For these facilities to function efficiently, different operations and processes occur at the site including vehicular fueling (diesel and unleaded gasoline storage), and maintenance operations (waste oil, oily rag, used filter, and new oil storage). These bus maintenance facilities have several buildings and structures, including the Bus Wash, Steam Cleaning Building, Fuel and Cleaning Islands, Maintenance Building, the Transportation Building, and Guard House/Fare Collection.

The William Lehman Center (WLC) serves as MDT's Metrorail repair yard. For the facility to function efficiently, different operations and processes occur at the site including vehicular fueling (diesel and unleaded gasoline storage), and maintenance operations (waste oil, oily rag, used filter, and new oil storage), The WLC has several buildings and structures, including the Vehicular Fueling Island, Maintenance Building, Warehouse Building, a warehouse and light railcar maintenance building (neither are in-service buildings), a train wash booth, a fire pump station, and an electrical substation.

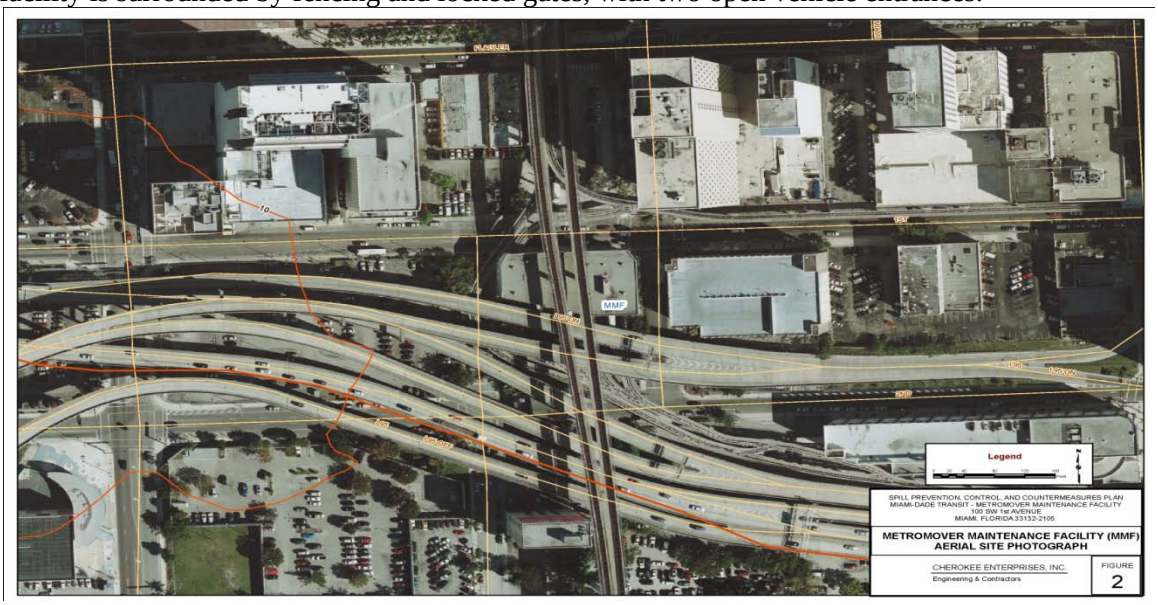
Finally, the Metromover Facility (MMF) serves as MDT's Metromover repair facility. For the facility to function efficiently, different operations and processes occur at the site including maintenance operations (waste oil, oily rag, used aerosol, and new oil storage). The MMF has one bi-level building and two parking lots.

MDT has been committed to achieving its environmental goals by utilizing sound environmental management practices and the organization views the implementation of the ISO 14001 as a way to reinforce its commitment for environmental stewardship and implementing pollution prevention programs and continually improving environmental performance to minimize environmental issues. In addition, the implementation of the ISO 14001 will reinforce MDT's current environmental practices as it starts on a major expansion of metrorail corridor from Earlington Heights Metrorail to the Miami Intermodal Center.

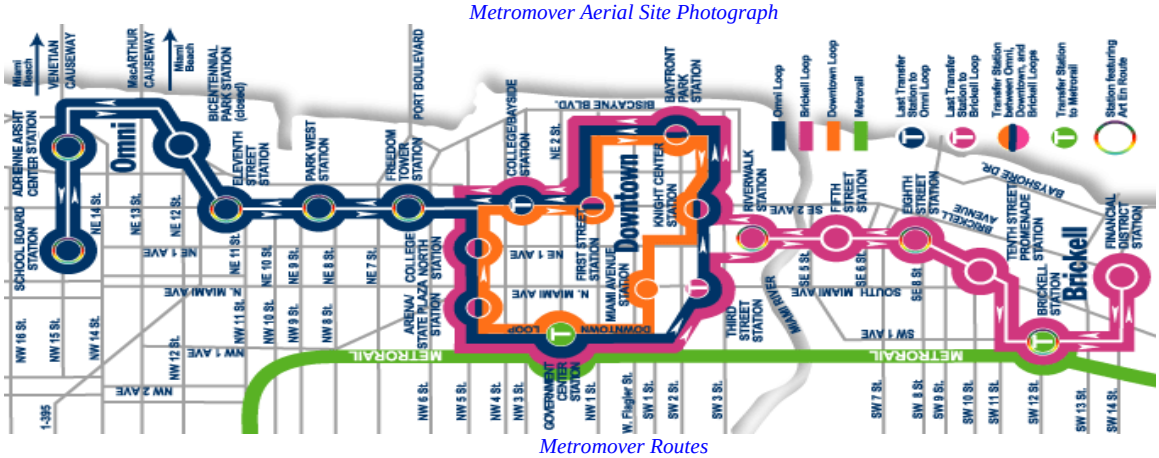
Fence Line

The MDT Metromover Facility (MMF) is situated under several rail and highway overpasses in downtown Miami, Florida. Facility terrain is relatively level and the entire facility encompasses approximately 1.04 acres (property records list the building with a 0.376-acre footprint). The facility is located at 25°46'23.35" degrees north latitude and 80°11'46.57" degrees west longitude.

The surrounding land use, within a one-mile radius, is a mix of commercial and residential properties. The MMF is situated on oolitic limestone in the Miami Oolite formation and the U.S. Fish and Wildlife Service classify its land use as “uplands”, i.e., neither wetlands nor deepwater habitat. According to topographic data, the facility is on flat terrain, about 10 feet above sea level, with area drainage assumedly having an overall bias to the south, to the Miami River. However, four storm water drainage inlets are located in the facility’s parking lots, and they provide drainage for the majority of the facility (excluding the exterior of the building). The MMF has one bi-level building and two parking lots. Petroleum products are stored aboveground inside the loading dock, the lower-level corridor, and the upper level maintenance area. The two parking lots occupy the majority of the facility’s remaining area, with some concrete walkways, compacted gravels, grass, and low-lying vegetation in between. The perimeter of the facility is surrounded by fencing and locked gates, with two open vehicle entrances.



Metromover Aerial Site Photograph



Metromover Routes

Core Team

The EMS core team is made up of the following MDT personnel:

Title/Position/Role/	Responsibilities in the Environmental Management System (EMS)
Director * *Mr. Harpal Kapoor, P.E.*	• Endorses the MDT Corporate Environmental Policy. • Assures all department areas are committed to continual improvement in environmental performance. • Supports the development and continued implementation of the overall EMS program. • Participates in a Management Review of MDT's EMS.
Manager of Materials * *Mr. Freeman Wright*	• Documents procedures and Standard Operational Procedures (SOPs) pertaining to operations (handling, shipping and receiving, and hazardous waste handling). • Assures delivery, transport, handling and storage of all materials on-site is done accordingly to regulatory guidelines, directives, and EMS requirements.
Manager of Training * *Ms. Vivian Urchdorf*	• Ensures complete training of employees in the environmental policy and SOPs as specified in the training procedures. • Collaborates with the EMS Coordinator on the development of training needs and programs. • Facilitates internal communication of EMS elements according to the Communication Procedure. Coordinates with Security to facilitate external communication of EMS elements according to the Communication Procedure.
Manager of Environmental Protection ** *** *Mr. Akbar Sharifi, P.E.*	• Develops, implements, and maintains MDT's EMS. • Ensures the Environmental Office activities meet the environmental regulations, permit conditions, terms, and policies. • Ensures EMS Procedures and SOPs are established, maintained, and followed. • Reviews non-conformances generated by the internal audit process. • Implements and verifies corrective and preventive action plans when required. • Communicates the status of the EMS to the Sr. Mgmt. for the purposes of improvement. • Ensures overall maintenance of the MDT's EMS, including the update and maintenance of: ➢ The Environmental Policy ➢ Environmental Aspects and Significant Aspects ➢ Maintenance of legal and other requirements ➢ Evidence of progress towards objectives and targets ➢ Environmental Management Programs (EMPs) ➢ Environmental Department procedures and SOPs ➢ Environmental Compliance Manual ➢ Pollution Prevention Plan ➢ Forms and environmental records

Facilities Maintenance Manager ** *Mr. Mario Rodriguez* *Mr. Steve Chayt*	• Ensures the Facility Maintenance department activities meet the environmental regulations, permit conditions, terms and policies. • Ensures the EMS SOPs are established, maintained, and followed.
Supervisors ** *** *Mr. Steve Alvarez*	• Communicates employee feedback on the Environmental Policy. • Trains and communicates pertinent SOPs to the employees of their respective areas. • Ensures employees in their respective areas have the training and tools to meet the requirements of the procedures.
Employees	• Performs assigned tasks in accordance with the regulations, the Environmental Policy, pertinent procedures and SOPs. • Communicates concerns to the supervisor regarding the performance of tasks, in accordance to the above listed requirements.
Internal Auditors / Audit Team *** *Mr. Akbar Sharifi, P.E.* *Mr. Adien Toledo*	• Performs audits according to a specific audit plan or schedule. • Conducts internal audits of the MDT, comparing against procedural requirements and the ISO 14001 standard. • Reports the results of the audits to the Manager of Safety and Environmental Protection.
Environmental Team *** *Mr. Akbar Sharifi, P.E.* *Mr. Adien Toledo*	• Represents each operational area during the Environmental Team Meetings. • Identifies MDT's Environmental Aspects, Significant Aspects, Objectives and Targets. • Facilitates the initial drafts of MDT's procedures, SOPs and other elements of the EMS.
Public Safety Officer ** *Mr. Eric Muntan*	• Notifies the Manager of Environmental Protection and Manager of Security in reference to environmental emergencies. • Transfers external calls to the Environmental Office in reference to environmental inquiries and complaints.
Manager of Construction ** *** *Mr. Surinder Sahota, P.E.*	• Ensures construction activities meet the environmental regulations permit conditions, terms and policies. • Ensures the EMS procedures are established, maintained, and followed.
Manager of Contract Procurement ** *Mr. Fred Shields*	• Ensures contractor support of EMS policies through contractual obligations. • Documents SOPs pertaining to purchasing materials and/or services with environmental impacts.

KEY ROLES

* SENIOR MANAGEMENT STAFF
** MANAGEMENT REPRESENTATIVE
*** ENV TEAM

Key Drivers

MDT's most significant programs/initiatives planned for the next couple of years include new programs to improve customer service, maximize revenue, renew infrastructure, and increase transit efficiency and effectiveness. MDT's management team continually sets its strategic objectives by establishing sound management and operation policies, and establishing performance measures and targets. MDT's overall environmental policy provides a roadmap for the Department to improve and protect the environment and the health and safety of our employees, customers and the general public. As a result, MDT has adopted the ISO 14001 standards for implementation of an Environmental Management System (EMS).

Significant Aspects and Impacts

The MDT has established and maintained a procedure to identify the environmental aspects of its activities, products and services and to determine which aspects have or can have significant impacts on the environment. Environmental aspects are determined by analyzing the inputs and outputs relating to current and past activities, products and services. The cause and effect relationship between environmental aspects and impacts means that once aspects have been identified, the impacts that result from these aspects can be determined.

The Miami-Dade Transit (MDT) Environmental Management System (EMS) team has developed the following environmental aspects and impacts including **four (4) Significant Aspects/Impacts (SA/I)**. These include:

- **Used Oil (SA/I)** - Filling, Storing and Removing Used Oils from 200-Gallon AST
- **Fluorescent Lamp/Used Ballast** - Replacing Fluorescent Bulb as needed, and replacing Light Ballasts (an electrical component used with a fluorescent bulb or mercury vapor lamp or arc lamp)
- **Aerosol Cans (SA/I)** - Parts Cleaners, Paints, Coating, Lubricant, etc.
- **Motor Oil (SA/I)** - Lubricant Engine Oil (SAE 30) – stored in 55-gallon drums.
- **Tires** - Changing New and Used Tires – Tires used to guide the Metro Mover in its tracks. Tires are changes once every 90,000 miles (approximately once every 2 years)
- **Industrial Waste Treatment (SA/I)** - Oil/Water Separator
- **Air Compressor Oil** - Changing Air Compressor Oil – used on train brakes. ½-quart of oil is changed once every 3 months.
- **Differential Oil** - Changing Differential Oil – used on tire axel. Approximately 22-pint or 3 gallons of oil is drained during oil changing process and transferred to a small bucket, and ultimately into a 55-gallon drum.
- **Train HVAC Filter** - Replace Train HVAC Filter. Filters are washed every 3 months and changed once a year.
- **Train Batteries** - Battery Servicing (Emergency Light for the Trains) – seal gel battery, which is maintenance free and is changed once every 5 years.
- **Flash Light/Lantern Battery** – power source for the flash light providing light source during maintenance activity in areas not visible by regular light.
- **Used Air Filters** - Preventative Maintenance on Air Compressors
- **Filters** - Office Heat & A/C Units
- **Electricity** - Office Heat & A/C Units (including various Train Stations)
- **Freon** - Office Heat & A/C Units
- **Belts** - Preventative Maintenance of A/C Chillers

- **Water** - Preventative Maintenance of A/C Chillers
- **Freon** - Preventative Maintenance of A/C Chillers
- **Bio-Hazard Waste** - Human Waste Clean-up
- **Absorbent Pads** - Spill Clean Up
- **Socks/Rags** - Spill Clean Up
- **Cleaners** - Interior and Exterior Cleaning
- **Sludge** - Pumping out OWS

Objectives and Targets

The following table outlines the objectives and targets of some of the main aspects:

Summary					
Aspect	**Objective**	**Target**	**Performance Indicator**	**Projected Complete Date**	**Progress Status Corrective Action**
5. Aerosol Cans	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	December 31, 2009	Purchased and implemented aerosol cans crusher equipment. In addition, implemented a strict SOP for Aerosol Cans Management.
6. Fluorescent Tube and Ballast	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	December 31, 2009	Purchased and implemented light bulb crusher equipment. In addition, implemented a strict SOP for Fluorescent Tube and Ballast Management.
7. Used Oil (i.e., filling, storing, transferring and removal of used oil from the 200-gallon abovegrou nd storage tank)	-Reduce and/or prevent any oil spill -Document handling and recycling of used oil	1.Update Spill Prevention, Control & Countermeasure (SPCC) Plan 2.Implement Standard Operating Procedures (SOPs) for Used Oil Management 3.Provide training to facility personnel	Monitor/document any spill events	1.December 3, 2009 2.February 10, 2010 3. May 20, 2010	1. Completed and implemented the SPCC Plan. 2. Implemented a strict SOP for Used Oil Management. 3. Completed the SPCC training.
8. Fresh Oil	-Reduce and/or prevent any oil spill -Document handling and recycling of used oil	1.Update Spill Prevention, Control & Countermeasure (SPCC) Plan 2.Implement Standard Operating Procedures (SOPs) for Fresh Oil Management 3.Provide training to facility personnel	1.Monitor/document any spill events 2.Documented records of inspections and testing	1.December 3, 2009 2.August 31, 2009 3.February 10, 2010 4. May 20, 2010	1. Completed the SPCC Plan. 2. Secondarily contained berm has been set up for the 55-gallon drums. 3. Implemented a strict SOP for Fresh Oil Management. 4. Completed the SPCC training.

5.Chlorofluorocarbons (CFCs) Management (i.e., refrigerant, coolant or freon)	Reduce CFC emission into the air	Train technicians to properly manage, service, and document all CFC's that are removed from a refrigeration unit for recharging or equipment disposal	Training records	1.May 20, 2010 2. February 10, 2010	1. Completed the SPCC training. 2. Implemented a strict SOP for CFC Management.
6. Used Tires	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	February 10, 2010	1. Implemented a strict SOP for Used Tires Management.
7. Industrial Wastewater Treatment (i.e., Oil/Water Separator)	Reduce and/or prevent industrial wastewater discharges	1. Establish baseline for facility industrial wastewater discharge system. 2. Complete evaluation of effectiveness existing system. 3. Document and implement operational controls. 4.Document Best Management Practices (BMPs)	Monitor/document any discharges	1, 2, 3 & 4 - December 31, 2009 5.February 10, 2010	1. Established baseline document. 2. Completed evaluation of effectiveness of existing system. 3. Documented and implemented operational controls. 4. Documented BMPs as part of the Spill Prevention, Control and Countermeasure (SPCC) plan. 5. Implemented a strict SOP for Industrial Waste Management.
8. Used Rags and Cotton Gloves	Properly dispose of contaminated rags and absorbents	Eliminate disposal of contaminated rags and absorbent pads in the landfill	Number of drums picked up by contractors and invoice records	February 10, 2010	Implemented used rag recycling program and a strict SOP for used rag/cotton gloves Management.
9. Used Batteries	Reduce amount of batteries used	Reduce usage by 5%	Monitor the amount of batteries used and train employees	February 10, 2010	Battery recycling program has started and recycling container has been set up in front of the stock room. In addition, implemented a strict SOP for Used Batteries Management.
10. Office and Shop Recyclables	Recycle plastic, aluminum, cardboard, paper, scrap metal, printer & copier cartridges	Provide recycling bins and containers in offices and shop areas	Receipts, recycling vendor sign-in sheets, and employee training	February 10, 2010	Recycling bins for paper and cardboard have been set up in front of the manager's office. In addition, implemented a strict SOP for Office and Shop Recyclables Management.

11.Facility Electricity Reduction	To reduce the amount of electricity used at the Maintenance Shop and Mover Stations	Install new lighting fixtures in shop & office areas that are 25% to 30% more efficient. In addition, reduce overall electricity 5% by 2014 and 20% by 2025	Electrical Bills, train employees, facility assessment	December 31, 2010	Some light bulbs are being replaced. In addition, facility assessment is being in the process of completion.

Benefits of Adopting an EMS

After adopting and implementing the EMS, the MDT will realize the following benefits:

- Reduction and/or prevention of any spill.
- Formalization of Standard Operating Procedures (SOPs).
- Implementation of Best Management Practices (BMPs).
- Reduction of waste.
- Reduction of electricity consumption.
- Increased employee awareness of environmental issues.
- Increased management awareness.
- Increased compliance with regulations.
- Implementation of formal pollution prevention training program.

Resources

Cost	Amount
Total Labor (internal) Determined by an average of the hourly rate of all employees involved in developing and implementing the EMS manual over a period of approximately 1-1/2 year. This includes bi-weekly meetings, site visits, management review meetings, training, gap and final audits. 2,260 hrs x $50/hr. = $113,000.00	$113,000.00
Consultant(s) 610 hrs x $90/hr. = $54,900.00	$54,900.00
Travel	N/A
In-kind contributions from outside organizations (please describe)	N/A
Materials (e.g. promotional materials, software, please describe) Newsletter	$500.00

Total Hours = 2,870 hours
Total Labor Cost = $167,900.00

Cost Savings

For example, for the past six (6) months, MDT has realized a reduction of aerosol cans usage by 11%, which can translate to a cost saving of approximately $10,000 in labor and material. In addition, the MDT has realized a reduction of freon usage from 376 lbs in 2008/2009 to 26 lbs as of May 2010. However, as an overall cost saving evaluation, the MDT is in the process of gathering the cost saving data associated with implementation the EMS.

Next Steps

MDT has successfully implemented an EMS at the Metromover facility. As a result, MDT is seeking to obtain a full certification by an independent ISO 14001 certification body. In addition, MDT is seeking to further expand it ISO 14001 standard to each of the three (3) bus maintenance facility and one (1) rail maintenance facility.

Management Commitment

The MDT EMS team along with senior management is in the process of establishing an EMS program at the MDT Metromover Facility. MDT's overall environmental policy provides a roadmap for the Department to improve and protect the environment, health and safety of our employees, customers and the general public. The Department is committed to achieving its environmental goals by integrating all aspects of its operations with sound environmental management practices. These include:

- Exceed compliance with all applicable local, state, and federal environmental regulations through best management practices;
- Establish waste minimization and pollution prevention programs to prevent or reduce impacts to the environment;
- Establish management system and control for environmental compliance assurance and risk/liability management;
- Streamline operations and management system by periodically evaluating achievement of targeted environmental objectives; and;
- Provide continuous training, and communicate environmental policies and programs to employees.

The Department is committed to implementing pollution prevention programs and continually improving environmental performance to minimize environmental issues. The Environmental Policy will be communicated to all employees and available to the Public via the Department website.

Miami-Dade Transit Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Miami-Dade Transit on June 21 and 22, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

The site visit involved a review of the core EMS documents with the EMS team. The Miami-Dade EMS Team participated in the review and discussion regarding the scoring.

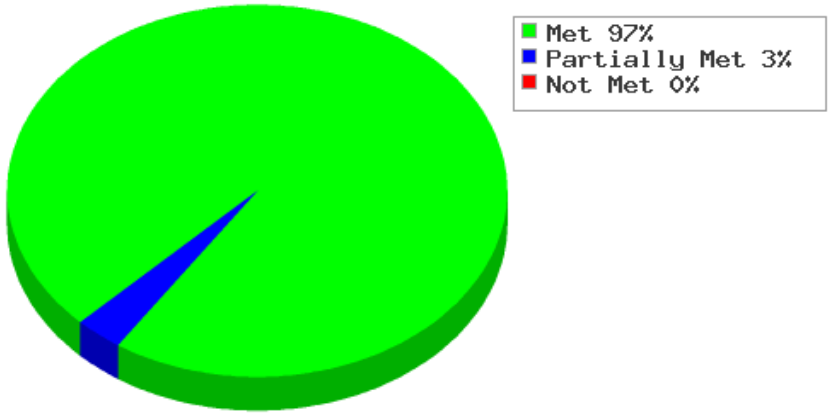
The following scores are the result of the EMS Assessment:

Detailed scoring on next page

Miami-Dade Transit - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**99%**
Percent of requirements **"Met"**	**97%**
Percent of requirements **"Partially Met"**	**3%**
Percent of requirements **"Not Met"**	**0%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	93	86	14	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	83	67	33	0